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☑ Final Report
☐ Revised Report

Report Date:
25-Sep-18 10:59

Laboratory Report
SC50211

Gulf Oil L.P.
281 Eastern Avenue
Chelsea, MA 02150
Attn: Andrew P. Adams

Project: Gulf Terminal - Chelsea, MA
Project #: Gulf Chelsea

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the sample(s) as received.
All applicable NELAC requirements have been met.

Massachusetts # M-MA138/MA1110
Connecticut # PH-0777
Florida # E87936
Maine # MA138
New Hampshire # 2972/2538
New Jersey # MA011
New York # 11393
Pennsylvania # 68-04426/68-02924
Rhode Island # LAO00348
USDA # P330-15-00375
Vermont # VT-11393

Authorized by:

Dawn Wojcik
Laboratory Director

Dawn E Wojcik

Eurofins Spectrum Analytical holds primary certification in the State of Massachusetts for the analytes as indicated with an X in the "Cert." column within this report. Please note that the State of Massachusetts does not offer certification for all analytes. Please refer to our website for specific certification holdings in each state.
Please note that this report contains 13 pages of analytical data plus Chain of Custody document(s). When the Laboratory Report is indicated as revised, this report supersedes any previously dated reports for the laboratory ID(s) referenced above. Where this report identifies subcontracted analyses, copies of the subcontractor's test report are available upon request. This report may not be reproduced, except in full, without written approval from Eurofins Spectrum Analytical, Inc.

Eurofins Spectrum Analytical, Inc. is a NELAC accredited laboratory organization and meets NELAC testing standards. Use of the NELAC logo however does not insure that Eurofins Spectrum Analytical, Inc. is currently accredited for the specific method or analyte indicated. Please refer to our 'Quality' web page at www.spectrum-analytical.com for a full listing of our current certifications and fields of accreditation. States in which Eurofins Spectrum Analytical, Inc. holds NELAC certification are New York, New Hampshire, New Jersey, Pennsylvania and Florida. All analytical work for Volatile Organic and Air analysis are transferred to and conducted at our 830 Silver Street location (PA-68-04426).

Please contact the Laboratory or Technical Director at 800-789-9115 with any questions regarding the data contained in this laboratory report.

Sample Summary

Work Order: SC50211

Project: Gulf Terminal - Chelsea, MA

Project Number: Gulf Chelsea

Laboratory ID	Client Sample ID	Matrix	Date Sampled	Date Received
SC50211-01	Outfall 003	Surface Water	12-Sep-18 05:45	12-Sep-18 13:55
SC50211-02	TB-1/-2	Aqueous	12-Sep-18 00:00	12-Sep-18 13:55

CASE NARRATIVE:

Data has been reported to the RDL. This report excludes estimated concentrations detected below the RDL and above the MDL (J-Flag).

All non-detects and all results below the reporting limit are reported as "<" (less than) the reporting limit in this report.

The samples were received 2.9 degrees Celsius, please refer to the Chain of Custody for details specific to temperature upon receipt. An infrared thermometer with a tolerance of +/- 1.0 degrees Celsius was used immediately upon receipt of the samples.

If a Matrix Spike (MS), Matrix Spike Duplicate (MSD) or Duplicate (DUP) was not requested on the Chain of Custody, method criteria may have been fulfilled with a source sample not of this Sample Delivery Group. If method or program required MS/MSD/Dup were not performed, sufficient sample was not provided to the laboratory.

Analyses for Total Hardness, pH, and Total Residual Chlorine fall under the state of Pennsylvania code Chapter 252.6 accreditation by rule.

See below for any non-conformances and issues relating to quality control samples and/or sample analysis/matrix.

SW846 8260C

Calibration:

1807003

Analyte quantified by quadratic equation type calibration.

Naphthalene

This affected the following samples:

1812751-BLK1
1812751-BS1
1812751-BSD1
Outfall 003
S820548-ICV1
S822197-CCV1
TB-1/-2

SW846 8270D SIM

Blanks:

1812441-BLK2

The method blank contains analyte at a concentration above the MRL; however, concentration is less than 10% of the sample result, which is negligible according to method criteria.

Naphthalene

Laboratory Control Samples:

1812441 BS/BSD

Naphthalene percent recoveries (35/36) are outside individual acceptance criteria (40-140), but within overall method allowances. All reported results of the following samples are considered to have a potentially low bias:

Outfall 003

1812441-BS2

Analyte is found in the associated blank as well as in the sample (CLP B-flag).

Naphthalene

1812441-BSD2

SW846 8270D SIM

Laboratory Control Samples:

1812441-BSD2

Analyte is found in the associated blank as well as in the sample (CLP B-flag).

Naphthalene

Samples:

S822131-CCV1

Analyte percent difference is outside individual acceptance criteria (20), but within overall method allowances.

Benzo (a) pyrene (108%)
Naphthalene (-73.5%)

This affected the following samples:

1812441-BLK2
1812441-BS2
1812441-BSD2

Sample Acceptance Check Form

Client:	Gulf Oil L.P.
Project:	Gulf Terminal - Chelsea, MA / Gulf Chelsea
Work Order:	SC50211
Sample(s) received on:	9/12/2018

The following outlines the condition of samples for the attached Chain of Custody upon receipt.

	Yes	No	N/A
Were custody seals present?	☐	☑	☐
Were custody seals intact?	☐	☐	☑
Were samples received at a temperature of ≤ 6°C?	☑	☐	☐
Were samples refrigerated upon transfer to laboratory representative?	☑	☐	☐
Were sample containers received intact?	☑	☐	☐
Were samples properly labeled (labels affixed to sample containers and include sample ID, site location, and/or project number and the collection date)?	☑	☐	☐
Were samples accompanied by a Chain of Custody document?	☑	☐	☐
Does Chain of Custody document include proper, full, and complete documentation, which shall include sample ID, site location, and/or project number, date and time of collection, collector's name, preservation type, sample matrix and any special remarks concerning the sample?	☐	☑	☐
Did sample container labels agree with Chain of Custody document?	☑	☐	☐
Were samples received within method-specific holding times?	☑	☐	☐

Summary of Hits

Lab ID: SC50211-01 **Client ID:** Outfall 003

Parameter	Result	Flag	Reporting Limit	Units	Analytical Method
Total Suspended Solids	11.1		0.5	mg/l	SM2540D (11)

Please note that because there are no reporting limits associated with hazardous waste characterizations or micro analyses, this summary does not include hits from these analyses if included in this work order.

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
Outfall 003	Gulf Chelsea	Surface Water	12-Sep-18 05:45	12-Sep-18
SC50211-01				

CAS No.	Analyte(s)	Result	Flag	Units	*RDL	MDL	Dilution	Method Ref.	Prepared	Analyzed	Analyst	Batch	Cert.
Volatile Organic Compounds													
Volatile Organic Compounds by SW846 8260 Prepared by method SW846 5030 Water MS													
71-43-2	Benzene	< 1.00		µg/l	1.00	0.34	1	SW846 8260C	20-Sep-18	21-Sep-18	MP	1812751	
1634-04-4	Methyl tert-butyl ether	< 1.00		µg/l	1.00	0.30	1	"	"	"	"	"	
91-20-3	Naphthalene	< 2.00		µg/l	2.00	1.39	1	"	"	"	"	"	
64-17-5	Ethanol	< 200		µg/l	200	13.2	1	"	"	"	"	"	
Surrogate recoveries:													
460-00-4	*4-Bromofluorobenzene*	*92*			*70-130 %*			"	"	"	"	"	
2037-26-5	*Toluene-d8*	*98*			*70-130 %*			"	"	"	"	"	
17060-07-0	*1,2-Dichloroethane-d4*	*100*			*70-130 %*			"	"	"	"	"	
1868-53-7	*Dibromofluoromethane*	*99*			*70-130 %*			"	"	"	"	"	
Semivolatile Organic Compounds by GCMS													
SVOCs by SIM Prepared by method SW846 3510C													
50-32-8	Benzo (a) pyrene	< 0.051		µg/l	0.051	0.020	1	SW846 8270D SIM	13-Sep-18	21-Sep-18	MSL	1812441	
91-20-3	Naphthalene	< 0.051		µg/l	0.051	0.022	1	"	"	"	"	"	
Surrogate recoveries:													
205440-82-0	*Benzo (e) pyrene-d12*	*43*			*30-130 %*			"	"	"	"	"	
Extractable Petroleum Hydrocarbons Prepared by method General Preparation SVOC													
	Oil & Grease	< 1.01	OG	mg/l	1.01	0.924	1	EPA 1664B	13-Sep-18	17-Sep-18	JB	1812461	X
General Chemistry Parameters													
	pH	**7.23**	pH	pH Units			1	ASTM D 1293-99B	12-Sep-18 16:00	12-Sep-18 16:45	BD	1812439	X
	Total Suspended Solids	**11.1**		mg/l	0.5	0.2	1	SM2540D (11)	13-Sep-18	15-Sep-18	CMB	1812454	X

Sample Identification	Client Project #	Matrix	Collection Date/Time	Received
TB-1/-2	Gulf Chelsea	Aqueous	12-Sep-18 00:00	12-Sep-18
SC50211-02				

CAS No.	*Analyte(s)*	*Result*	*Flag*	*Units*	**RDL*	*MDL*	*Dilution*	*Method Ref.*	*Prepared*	*Analyzed*	*Analyst*	*Batch*	*Cert.*
Volatile Organic Compounds													
Volatile Organic Compounds by SW846 8260 Prepared by method SW846 5030 Water MS													
71-43-2	Benzene	< 1.00		µg/l	1.00	0.34	1	SW846 8260C	20-Sep-18	21-Sep-18	MP	1812751	
1634-04-4	Methyl tert-butyl ether	< 1.00		µg/l	1.00	0.30	1	"	"	"	"	"	
91-20-3	Naphthalene	< 2.00		µg/l	2.00	1.39	1	"	"	"	"	"	
64-17-5	Ethanol	< 200		µg/l	200	13.2	1	"	"	"	"	"	
Surrogate recoveries:													
460-00-4	*4-Bromofluorobenzene*	*91*			*70-130 %*			"	"	"	"	"	
2037-26-5	*Toluene-d8*	*98*			*70-130 %*			"	"	"	"	"	
17060-07-0	*1,2-Dichloroethane-d4*	*100*			*70-130 %*			"	"	"	"	"	
1868-53-7	*Dibromofluoromethane*	*98*			*70-130 %*			"	"	"	"	"	

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8260C										
Batch 1812751 - SW846 5030 Water MS										
Blank (1812751-BLK1)						Prepared & Analyzed: 20-Sep-18				
Benzene	< 1.00		µg/l	1.00						
Methyl tert-butyl ether	< 1.00		µg/l	1.00						
Naphthalene	< 2.00		µg/l	2.00						
Ethanol	< 200		µg/l	200						
Surrogate: 4-Bromofluorobenzene	*44.9*		µg/l		*50.0*		*90*	*70-130*		
Surrogate: Toluene-d8	*49.1*		µg/l		*50.0*		*98*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*50.9*		µg/l		*50.0*		*102*	*70-130*		
Surrogate: Dibromofluoromethane	*49.2*		µg/l		*50.0*		*98*	*70-130*		
LCS (1812751-BS1)						Prepared & Analyzed: 20-Sep-18				
Benzene	**22.0**		µg/l		20.0		110	70-130		
Methyl tert-butyl ether	**19.6**		µg/l		20.0		98	70-130		
Naphthalene	**19.4**		µg/l		20.0		97	70-130		
Ethanol	**470**		µg/l		400		118	70-130		
Surrogate: 4-Bromofluorobenzene	*47.7*		µg/l		*50.0*		*95*	*70-130*		
Surrogate: Toluene-d8	*50.3*		µg/l		*50.0*		*101*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*49.0*		µg/l		*50.0*		*98*	*70-130*		
Surrogate: Dibromofluoromethane	*49.6*		µg/l		*50.0*		*99*	*70-130*		
LCS Dup (1812751-BSD1)						Prepared: 20-Sep-18 Analyzed: 21-Sep-18				
Benzene	**22.9**		µg/l		20.0		114	70-130	4	20
Methyl tert-butyl ether	**20.4**		µg/l		20.0		102	70-130	4	20
Naphthalene	**18.9**		µg/l		20.0		95	70-130	3	20
Ethanol	**493**		µg/l		400		123	70-130	5	20
Surrogate: 4-Bromofluorobenzene	*47.3*		µg/l		*50.0*		*95*	*70-130*		
Surrogate: Toluene-d8	*49.5*		µg/l		*50.0*		*99*	*70-130*		
Surrogate: 1,2-Dichloroethane-d4	*48.5*		µg/l		*50.0*		*97*	*70-130*		
Surrogate: Dibromofluoromethane	*49.7*		µg/l		*50.0*		*99*	*70-130*		

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
SW846 8270D SIM										
Batch 1812441 - SW846 3510C										
Blank (1812441-BLK2)					Prepared: 13-Sep-18 Analyzed: 17-Sep-18					
Benzo (a) pyrene	< 0.050		µg/l	0.050						
Naphthalene	**0.0570**	QB1	µg/l	0.050						
Surrogate: Benzo (e) pyrene-d12	*0.630*		µg/l		*1.00*		*63*	*30-130*		
LCS (1812441-BS2)					Prepared: 13-Sep-18 Analyzed: 17-Sep-18					
Benzo (a) pyrene	**0.623**		µg/l	0.050	0.990		63	40-140		
Naphthalene	**0.347**	B	µg/l	0.050	0.990		35	40-140		
Surrogate: Benzo (e) pyrene-d12	*0.515*		µg/l		*0.990*		*52*	*30-130*		
LCS Dup (1812441-BSD2)					Prepared: 13-Sep-18 Analyzed: 17-Sep-18					
Benzo (a) pyrene	**0.568**		µg/l	0.050	1.00		57	40-140	9	20
Naphthalene	**0.360**	B	µg/l	0.050	1.00		36	40-140	4	20
Surrogate: Benzo (e) pyrene-d12	*0.450*		µg/l		*1.00*		*45*	*30-130*		

Extractable Petroleum Hydrocarbons - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
EPA 1664B										
Batch 1812461 - General Preparation SVOC										
Blank (1812461-BLK1)					Prepared: 13-Sep-18 Analyzed: 17-Sep-18					
Oil & Grease	< 1.03		mg/l	1.03						
LCS (1812461-BS1)					Prepared: 13-Sep-18 Analyzed: 17-Sep-18					
Oil & Grease	**33.6**		mg/l	1.03	41.0		82	78-114		

General Chemistry Parameters - Quality Control

Analyte(s)	Result	Flag	Units	*RDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
ASTM D 1293-99B										
Batch 1812439 - General Preparation										
Reference (1812439-SRM1)						Prepared & Analyzed: 12-Sep-18				
pH	**6.02**		pH Units		6.00		100	97.5-102.5		
Reference (1812439-SRM2)						Prepared & Analyzed: 12-Sep-18				
pH	**5.99**		pH Units		6.00		100	97.5-102.5		
SM2540D (11)										
Batch 1812454 - General Preparation										
Blank (1812454-BLK1)						Prepared: 13-Sep-18 Analyzed: 15-Sep-18				
Total Suspended Solids	< 0.5		mg/l	0.5						
LCS (1812454-BS1)						Prepared: 13-Sep-18 Analyzed: 15-Sep-18				
Total Suspended Solids	**100**		mg/l	10.0	100		100	90-110		

Notes and Definitions

B	Analyte is found in the associated blank as well as in the sample (CLP B-flag).
QB1	The method blank contains analyte at a concentration above the MRL; however, concentration is less than 10% of the sample result, which is negligible according to method criteria.
dry	Sample results reported on a dry weight basis
NR	Not Reported
RPD	Relative Percent Difference
OG	The required Matrix Spike and Matrix Spike Duplicate (MS/MSD) for Oil & Grease method 1664B can only be analyzed when the client has submitted sufficient sample volume. An extra liter per MS/MSD is required to fulfill the method QC criteria. Please refer to Chain of Custody and QC Summary (MS/MSD) of the Laboratory Report to verify ample sample volume was submitted to fulfill the requirement.
pH	The method for pH does not stipulate a specific holding time other than to state that the samples should be analyzed as soon as possible. For aqueous samples the 40 CFR 136 specifies a holding time of 15 minutes from sampling to analysis. Therefore all aqueous pH samples not analyzed in the field are considered out of hold time at the time of sample receipt. All soil samples are analyzed as soon as possible after sample receipt.

Laboratory Control Sample (LCS): A known matrix spiked with compound(s) representative of the target analytes, which is used to document laboratory performance.

Matrix Duplicate: An intra-laboratory split sample which is used to document the precision of a method in a given sample matrix.

Matrix Spike: An aliquot of a sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Method Blank: An analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. The method blank is used to document contamination resulting from the analytical process.

Method Detection Limit (MDL): The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.

Reportable Detection Limit (RDL): The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. For many analytes the RDL analyte concentration is selected as the lowest non-zero standard in the calibration curve. While the RDL is approximately 5 to 10 times the MDL, the RDL for each sample takes into account the sample volume/weight, extract/digestate volume, cleanup procedures and, if applicable, dry weight correction. Sample RDLs are highly matrix-dependent.

Surrogate: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. These compounds are spiked into all blanks, standards, and samples prior to analysis. Percent recoveries are calculated for each surrogate.

Continuing Calibration Verification: The calibration relationship established during the initial calibration must be verified at periodic intervals. Concentrations, intervals, and criteria are method specific.

SC 50211 By

SPECTRUM ANALYTICAL, INC.
Featuring
HANIBAL TECHNOLOGY

CHAIN OF CUSTODY RECORD

Page 1 of 1

Special Handling:
- ☑ Standard TAT - 7 to 10 business days
- ☐ Rush TAT - Date Needed: _____

All TATs subject to laboratory approval
Min. 24-hr notification needed for rushes
Samples disposed after 60 days unless otherwise instructed.

Report To: Andrew Adams
Gulf Oil LP
281 Eastern Ave
Chelsea, MA 02150
Telephone #: 617.884.5980
Project Mgr: Andrew Adams

Invoice To: Christopher Gill
Gulf Oil LP
80 William St, Suite 400
Wellesley, MA 02481-3705
P.O No.: _____ Quote/RQN: _____

Project No: Gulf Chelsea
Site Name: Gulf Chelsea Terminal
Location: 281 Eastern Ave, Chelsea State: MA
Sampler(s): _____

F=Field Filtered 1=Na_2S2O_3 2=HCl 3=H_2SO_4 4=HNO_3 5=NaOH 6=Ascorbic Acid
7=CH3OH 8=$NaHSO_4$ 9=Deionized Water 10=H_3PO_4 11= none 12= _____

DW=Dinking Water GW=Groundwater SW=Surface Water WW=Waste Water
O=Oil SO=Soil SL=Sludge A=Indoor/Ambient Air SG=Soil Gas
X1= _____ X2= _____ X3= _____

G= Grab C=Compsite

Lab ID:	Sample ID:	Date:	Time:	Type	Matrix	Containers: # of VOA Vials	# of Amber Glass	# of Clear Glass	# of Plastic	Analysis: TSS, pH (11)	O&G (3)	VOCs (see notes for list) (2)	PAH (benz(a) pyre ne & naphthalene) (11)	Check if chlorinated	QA/QC Reporting Notes: * additional charges may appply
SC 50211-01	Outfall 003	9-12-18	0545	G	SW				2	X				☐	
	Outfall 003	9-12-18	0545	G	SW		1				X			☐	VOCs: benzene, naphthalene,
	Outfall 003	9-12-18	0545	G	SW	3						X		☐	MTBE, and ethanol
	Outfall 003	9-12-18	0545	G	SW		2						X	☐	
-02	TB-1 Trip Blank	9-12-18				1								☐	Required MLs:
↓	TB-2 Trip Blank	9-12-18				1								☐	benzene 2 µg/L
														☐	naphthalene 5 µg/L
														☐	benzo(a)pyrene 0.1 µg/L
														☐	
														☐	

List Preservative Code below: 11 | 3 | 2 | 11

MA DEP MCP CAM Report? ☐ Yes ☐ No
CT DPH RCP Report? ☐ Yes ☐ No
☑ Standard ☐ No QC ☐ DQA*
☐ ASP A* ☐ ASP B*
☐ NJ Reduced* ☐ NJ Full*
☐ Tier II* ☐ Tier IV*
☐ Other: _____
State-specific reporting standards:

Relinquished by:	Received by:	Date:	Time:	Temp °C
		9-12-18	1540	Observed
		9/12/18	0650	Correction Factor
			13:55	Corrected
				IR ID #

☐ EDD format: _____
☑ E-mail to: aadams@gulfoil.com, cgill@gulfoil.com, and jennifer.atkins@aecom.com

Condition upon receipt: Custody Seals: ☐ Present ☐ Intact ☐ Broken
☐ Ambient ☐ Iced ☒ Refrigerated ☐ DI VOA Frozen ☐ Soil Jar Frozen

2-9/0/2.9 IR01

Batch Summary

1812439

General Chemistry Parameters

1812439-SRM1
1812439-SRM2
SC50211-01 (Outfall 003)

1812441

Semivolatile Organic Compounds by GCMS

1812441-BLK2
1812441-BS2
1812441-BSD2
SC50211-01 (Outfall 003)

1812454

General Chemistry Parameters

1812454-BLK1
1812454-BS1
SC50211-01 (Outfall 003)

1812461

Extractable Petroleum Hydrocarbons

1812461-BLK1
1812461-BS1
SC50211-01 (Outfall 003)

1812751

Volatile Organic Compounds

1812751-BLK1
1812751-BS1
1812751-BSD1
SC50211-01 (Outfall 003)
SC50211-02 (TB-1/-2)

S820548

Volatile Organic Compounds

S820548-CAL1
S820548-CAL2
S820548-CAL3
S820548-CAL4
S820548-CAL5
S820548-CAL6
S820548-CAL7
S820548-CAL8
S820548-CAL9
S820548-ICV1
S820548-LCV1
S820548-LCV2
S820548-TUN1

S821213

Semivolatile Organic Compounds by GCMS

S821213-CAL1
S821213-CAL2
S821213-CAL3
S821213-CAL4
S821213-CAL5
S821213-CAL6
S821213-CAL7
S821213-CAL8
S821213-CAL9
S821213-ICV1
S821213-LCV1
S821213-LCV2
S821213-TUN1

S822131

Semivolatile Organic Compounds by GCMS

S822131-CCV1
S822131-TUN1

S822197

Volatile Organic Compounds

S822197-CCV1
S822197-TUN1

S822242

Semivolatile Organic Compounds by GCMS

S822242-CCV1
S822242-TUN1